GEOMORPHOLOGY OF THE "SPILLWAY" AREA AT THE HEAD OF PERSEVERANCE VALLEY, ENDEAVOUR CRATER, MARS.

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Perseverance Valley is a small anastomosing feature 180 meters in length that appears to flow into the crater from the rim crest. Although it is only somewhat similar to the well-known "Mars gullies," it nevertheless suggests an origin by fluid or fluidized flow. Opportunity began Its investigation of the plains west of Perseverance Valley around sol 4715. As of sol 4800, Opportunity has completed a "walkabout" of the plains and has begun its decent into the valley. Hgh-resolution orthomosaics and DEMs - compiled from the rover's navcam and pancam instruments – at 1cm/pixel and 1cm/posting, extending from 35 to 50 meters from the rover at each end of drive position. Multiple mosaics are combined to make a continuous map of the walkabout and Perseverance Valley. This map has revealed a number of surface textures that are either only just detectable in the HiRISE data, or are below the detectability limits of these data. 1. The narrowest gap in the crater rim between the plains and Perseverance Valley is 25 meters west of the break in slope into the valley. This feature appears analogous to spillways between rising terrestrial lakes and adjacent. 2. The HiRISE topography doesn't show a closed depression west of the Endeavour rim in this area, unless the modern plains have tilted westward by 0.5-0.8 degrees. Sediment compaction of the Burns formation, which thickens away from the crater rim, could easily produce this tilt, and would result in a small lake a couple meters deep and a few hundred meters across with the tilt removed. 3. A pair of ridges of aligned rocks define the northern "shoreline" of this proposed lake. One rock ridge lies at the base of this slope, and the other is partway up the slope. A similar, but less prominent ridge at the same elevation defines the southern "shoreline" of the lake. 4. The plains to either side of the spillway are patterned and grooved. The patterned ground polygons are about a meter across, and resemble patterned ground in periglacial environments on Earth. The grooves vary from 0.5-1 meter in width and trend roughly east-west on both sides of the crater rim. 5. Perseverance Valley exhibits very little relief - it may even be inverted near its head. It's preservation state as seen in HiRISE images may indicate coarser material in the channel deposits than incision by the channel into pre-existing rim topography.